

PROCEEDINGS
OF
THE ROYAL SOCIETY
OF
EDINBURGH.

VOL. II.

DECEMBER 1844 TO APRIL 1850.

EDINBURGH:
PRINTED BY NEILL AND COMPANY.
MDCCCLI.

Q41
E21

CONTENTS.

Account of the late Earthquake at Demerara. By W. H. Campbell, Esq. Communicated by M. Ponton, Esq., . . .	Page 1
On the Existence of an Electrical Apparatus in the Flapper Skate and other Rays. By Dr Stark, . . .	1
Observations on the Comet, visible now or lately in the Constellation of the Whale. By C. Rumker, Esq. Communicated by Sir T. M. Brisbane, Bart., . . .	3
On a Possible Explanation of the Adaptation of the Eye to Distinct Vision at Different Distances. By Professor Forbes, . . .	6
Notice of an Ancient Beach near Stirling. By Charles Maclaren, Esq., . . .	7
Farther Remarks on the Electrical Organs of the Rays. By Dr Stark, . . .	8
Observations on the same subject. By Professor Goodsir, . . .	9
Note on the Form of the Crystalline Lens. By Professor Forbes. Included in the former Abstract, . . .	9
On the Cause which has produced the Present Form and Condition of the Earth's Surface. By Sir George S. Mackenzie, Bart., . . .	9
Some Account of the Magnetic Observatory at Makerstoun, and of the Observations made there. By J. A. Broun, Esq. Communicated by Sir T. M. Brisbane, Bart., . . .	10
Description of a Sliding Scale for Facilitating the Use of the Moist-bulb Hygrometer. By James Dalmahoy, Esq., . . .	13
Account of Experiments to Measure the Direct Force of the Waves of the Atlantic and German Oceans. By Thomas Stevenson, Esq. Communicated by David Stevenson, Esq., . . .	13
A Verbal Communication in regard to Chevalier's Experiments on the Decomposition of certain Salts of Lead by Charcoal. By Dr Traill, . . .	15
On a Peculiar Modification of the Doubly Refracting Structure of Topaz. By Sir D. Brewster, K.H., . . .	16
Extracts from Letters to the General Secretary, on the Analogy of the Structure of some Volcanic Rocks with that of Glaciers. By C. Darwin, Esq., F.R.S. Specimens were exhibited. With Observations on the same subject, made by Professor Forbes, . . .	17
Letter from Professor Gordon, of Glasgow, on the subject of the Viscous Theory of Glaciers. Read by Professor Forbes, . . .	19

On the Existence of peculiar Crystals in the Cavities of the Topaz. Part I. By Sir D. Brewster, K.H.,	21
On the Use of Colourless Ink in Writing. By Sir George S. Mackenzie, Bart.,	21
On the Use of Metallic Reflectors for Sextants, and on the Determination of the Errors arising from Non-Parallelism in the Mirrors and Sun-Shades of Reflecting Instruments. By John Adie, Esq.,	22
On the Existence of peculiar Crystals in the Cavities of Topaz. Part II. By Sir David Brewster, K.H.,	23
On the Extraction of pure Phosphoric Acid from Bones, and on a New and Anomalous Phosphate of Magnesia. By Dr Gregory,	25
On the Improvement of Navigation in Tidal Rivers. By David Stevenson, Esq.,	26
On the Solvent Action of Drainage Water on Soils. By John Wilson, Esq., F.G.S. Communicated by Dr Gregory,	28
Observations on the Temperature of the Earth at Trevandrum, in Lat. $8^{\circ} 30' 32''$. By John Caldecott, Esq. Reduced, with some Remarks, by Professor Forbes,	29
Miscellaneous Observations on Blood and Milk. By Dr John Davy,	32
An Account of some of Mr Bain's applications of Electricity as a moving power to Clocks,	33
On Dr Wollaston's Argument from the limitation of the Earth's Atmosphere as to the Finite Divisibility of Matter. By Dr George Wilson,	34
Biographical Notice of the late Professor Henderson. By Professor Kelland,	35
On the Chemical Relations of Creosote. By Dr Gregory,	45
On the Thermometric Correction of Magnetic Instruments. By J. A. Broun, Esq.,	46
On the Constitution of Bebeerine. By Dr Douglas MacLagan, and Thomas G. Tilley, Esq., Birmingham,	46
On the Sums of the Digits of Numbers. By Bishop Terrot,	49
Notes on the Topography and Geology of the Cuchullin Hills in Skye; and on the Traces of Ancient Glaciers which they present. Part I. By Professor Forbes,	50
Notes on the Topography and Geology of the Cuchullin Hills in Skye; and the Traces of Ancient Glaciers which they present—(concluded). By Professor Forbes,	54
On the recent Eruption of Hecla, and the Volcanic Shower in Orkney. By Dr Traill,	56
On a new variety of Gamboge from the Wynaad. By Dr Christison,	58
Results of the Makerstoun Observations, No. 1. On the Relation of the Variations of the Earth's Magnetism to the Solar and Lunar Periods. By J. A. Broun, Esq. Communicated by Sir T. M. Brisbane, Bart.,	58
Experiments and Investigations as to the influence exerted over some Minerals by Animal and Vegetable matter, under certain conditions. By Mrs Margaret Henrietta Marshall. Communicated by Sir T. M. Brisbane, Bart.,	59

CONTENTS.

v

On the Action of Soluble Lead Salts on Natural Waters. By Professor Connell,	62
Claudia and Pudens; an attempt to shew that the Claudia mentioned in St Paul's Second Epistle to Timothy, was a British Princess. By Archdeacon Williams,	63
On the Decomposition and Dispersion of Light within Solid Bodies. By Sir David Brewster, K.H.,	64
A few Remarks suggested by Professor Forbes's Description of the effects of Glacial Action among the Cuchullin Hills, and Mr Maclaren's views of the facts observed by him at the Gareloch. By Sir G. S. Mackenzie, Bart.,	65
Remarks on certain grooved surfaces of Rock on Arthur's Seat. By the Rev. Dr Fleming,	67
Biographical Notice of the late Sir John Robison, K.H., Sec. R.S. Ed. By Professor Forbes,	68
On a method of rendering Magnetical Instruments Self-Registering. By J. A. Broun, Esq. Communicated by Sir T. M. Brisbane, Bart.,	79
Verbal Notice respecting the Thyroid, Thymus, and Supra-renal Bodies. By Professor Goodsir,	80
On the recent Scottish Madrepores, with Remarks on the Climatic Character of the Extinct Races. By the Rev. Dr Fleming,	82
On the principle of Vital Affinity, as illustrated by recent Observations in Organic Chemistry. Part I. By Dr Alison,	83
On the Personal Nomenclature of the Romans, with an especial reference to the Nomen of Caius Verres. By the Rev. J. W. Donaldson. Communicated by Bishop Terrot,	87
On the appearance of the Great Comet of 1843, at the Cape of Good Hope, with illustrative Drawings. By Professor Smyth. Communicated by the Secretary,	87
On the Existence of Fluorine in the Bones from Arthur's Seat. By Dr G. Wilson,	88
On the Composition of the Bones from Arthur's Seat. By Dr Christison,	88
On the Description of Oval Curves, and those having a plurality of Foci. By Mr James Clerk Maxwell; with remarks by Professor Forbes. Communicated by Professor Forbes,	89
On the Influence of Contractions of Muscles on the Circulation of the Blood. By Dr Wardrop,	91
On the Solubility of Fluoride of Calcium in Water, and the relation of this property to the occurrence of that Substance in Minerals, and in recent and Fossil Plants and Animals. By Dr G. Wilson,	91
On the Constitution and Properties of Picoline, a new organic base from Coal-Tar. By Dr T. Anderson,	94
Notice of Polished and Striated Rocks recently discovered on Arthur's Seat, and in some other places near Edinburgh. By David Milne, Esq.,	95
Results of the Makerstoun Observations, No. II. On the Relation of the Variations of the Vertical Component of the Earth's Magnetic Intensity to the Solar and Lunar Periods. By J. Allan Broun, Esq. Communicated by Sir T. M. Brisbane, Bart.,	97
Two Verbal Notices. (1.) On the Geology of Arthur Seat. (2.) On the Dentition of the Walrus. By the Rev. Dr Fleming,	98

On the Mean Height of the Barometer in different Latitudes. By Professor Hansteen of Christiania. Communicated in a Letter to the Secretary,	101
On the Extent to which Fluoride of Calcium is Soluble in Water at 60° F. By Dr George Wilson,	102
New Observations on the Glaciers of Savoy. Part I. By Professor Forbes,	103
New Observations on the Glaciers of Savoy. (Concluded). By Professor Forbes,	107
On General Differentiation. Part III. By the Rev. Professor Kelland,	108
Extracts from a Letter of Baron Berzelius. Communicated by Dr T. Anderson,	108
On the presumed long-continued Presence of Arsenic in the Human Stomach. By Dr Gregory,	110
Notes on the Superficial Strata of the Neighbourhood of Edinburgh. By the Rev. Dr Fleming. (Commenced.)	110
An Attempt to Elucidate and Apply Mr Warren's Doctrine respecting the Square Root of Negative Quantities. By Bishop Terrot,	111
Notes on the Superficial Strata of the Neighbourhood of Edinburgh. (Concluded.) By the Rev. Dr Fleming,	111
Speculation respecting the origin of Trap-Tuff, the Cause of Earthquakes, and of Partial Changes of the Bed of the Ocean. Part I. By Sir G. S. Mackenzie, Bart.,	114
On the Principle of Vital Affinity. Part II. By Dr Alison,	114
Speculation respecting the origin of Trap-Tuff, the Cause of Earthquakes, and of Partial Changes of the Bed of the Ocean. Part II. By Sir G. S. Mackenzie, Bart.,	115
On Vital Affinity. Parts II. and III. By Dr Alison,	117
On the Co-existence of Ovigerous Capsules and Spermatozoa in the same individuals of the Hydra Viridis. By Dr Allen Thomson,	123
On the Parallel Roads of Lochaber; with Remarks on the Change of relative Levels of Sea and Land in Scotland, and on the Detrital Deposits in that Country. Part I. By David Milne, Esq.,	124
On the Course of Observation to be pursued in future at the Royal Observatory of Edinburgh. By Professor Smyth,	126
Observations of Terrestrial Temperature made at Trevandrum Observatory, from May 1842 to December 1845. By John Caldecott, Esq. Communicated by Professor Forbes,	127
On the Temperature of Wells and Springs at Trevandrum in India (Lat. 8° 31', Long. 5 ^h 8 ^m). By Major-General Cullen, Madras Artillery. Communicated in a Letter to Professor Forbes,	128
Chemical Notices. By Dr Gregory,	129
Remarks on the Hypothesis of Progressive Development in the Organic Creation. By Sir G. S. Mackenzie, Bart.,	130
On the Parallel Roads of Lochaber; with Remarks on the Change of relative Levels of Sea and Land in Scotland, and on the Detrital Deposits in that Country. Part II. By David Milne, Esq.,	132
Verbal Communication on Fossils of the Lias Formation, from South Africa. By the Rev. Dr Fleming,	133

On Certain Products of Decomposition of the Fixed Oils in Contact with Sulphur. By Dr T. Anderson,	134
On the Structural relation of Oil and Albumen in the Animal Economy. By Dr J. H. Bennett,	136
Experiments on the Ordinary Refraction of Light, by Iceland Spar. By W. Swan, Esq. Communicated by Professor Kelland,	139
On the Boulder Formation and Superficial Deposits of Nova Scotia. By J. W. Dawson, Esq. Communicated by Dr Gregory,	140
On the Mode of Occurrence of Gypsum in Nova Scotia, and on its Probable Origin. By the Same,	141
On certain Anomalous Deviations of the Transit Instrument at the Royal Observatory. By Professor Smyth,	142
Results of Makerstoun Observations, No. III. On the Solar and Lunar periods of the Magnetic Declination. By J. A. Broun, Esq. Communicated by Sir T. M. Brisbane, Bart.,	144
Notice of Two Ores of Copper, one of them a New Mineral. By Professor Connell,	146
Biographical Memoir of the late Dr Hope. By Dr Traill,	148
Note on the Constitution of the Phosphates of the Organic Alkalies. By Dr Thomas Anderson,	148
Examination of some Theories of German Writers, and of Mr Grote, on the Authorship of the Iliad and Odyssey. By Professor Dunbar,	154
On Algebraical Symbolism. By Bishop Terrot,	156
Account of a Geological Examination of the Volcanoes of the Vivarais. By Professor Forbes,	158
Geological Notices. By the Rev. Dr Fleming,	159
Verbal Notice. By the Rev. Dr Fleming,	159
On the Preparation of Kreatine, and on the Amount of it in the Flesh of different Animals. By Dr Gregory,	160
Notices of a Flood at Frastanz, in the Vorarlberg, in the Autumn of 1846. By William Brown, Esq.	162
Contributions to the Phenomena of the Zodiacal Light. By Professor Smyth,	162
Practical Illustration of the Adjustments of the Equatorial Instrument. By Professor Smyth,	164
On the Vertebral Column, and some Characters that have been overlooked in the Descriptions both of the Anatomist and Zoologist. By Dr Macdonald,	166
On the Theory of the Parallel Roads of Lochaber. By James Thomson, Esq., jun., Glasgow. Communicated by Professor Forbes,	170
On an Instrument for measuring the extensibility of Elastic Solids. By Professor Forbes,	173
On the Anthracite of the Calton Hill. By the Rev. Dr Fleming,	175
On some Phenomena of Capillary Attraction observed with Chloroform, Bisulphuret of Carbon, and other Liquids. By Dr George Wilson,	176
Notice of the Orbit of the Binary Star α Centauri, as recently determined by Captain W. S. Jacob, Bombay Engineers. By Professor Smyth,	178

On the Colouring Matter of the <i>Morinda citrifolia</i> . By Dr Thomas Anderson,	179
An attempt to Improve the present Methods of determining the Strength and Direction of the Wind at Sea. By Professor Smyth,	180
On the Action of the Dry Gases on Organic Colouring Matters, and its relation to the Theory of Bleaching. By Dr George Wilson,	183
On the Products of the Destructive Distillation of Animal Substances. Part I. By Dr Thomas Anderson,	186
Note respecting the Refractive and Dispersive Power of Chloroform. By Professor Forbes,	187
Geological Notes on the Valleys of the Rhine and Rhone. By Robert Chambers, Esq.,	189
On the Classification of Colours. By Professor Forbes,	190
Description of a Mud-slide at Malta. By A. Milward, Esq. Communicated by the Secretary,	195
An attempt to explain the "Dirt-bands" of Glaciers. By A. Milward, Esq.,	195
On the rate of Progression of the Himalayan Glaciers. By Lieutenant R. Strachey, Bengal Engineers,	196
Observations on the preceding Communications, and especially on the Cause of the Annual Rings of Glaciers. By Professor Forbes,	196
An Account of Carnot's Theory of the Motive Power of Heat, with Numerical Results deduced from Regnault's Experiments on Steam. By Professor William Thomson of Glasgow,	198
Theoretical Considerations on the Effect of Pressure in Lowering the Freezing-Point of Water. By James Thomson, Esq., jun., Glasgow. Communicated by Professor W. Thomson,	204
On the Early History of the Air-Pump in England. By Dr George Wilson,	207
On the Classification of Colours. Part II. By Professor Forbes. (See p. 190),	214
Verbal Notice of Silicious Stalactites on Arthur's Seat. By the Rev. Dr Fleming,	216
On some peculiar Impressions on the Surface of certain Strata of Greywacké Schist, at Goldielands, in Roxburghshire. By James Elliot. Communicated by David Milne, Esq.,	217
On the Causes of Local Peculiarities of Temperature in different parts of Great Britain. By James Elliot. Communicated by David Milne, Esq.,	218
Verbal Notices. By the Rev. Dr Fleming,	219
Notice by Professor Smyth of Locke's Electric Observing Clock,	220
Abstract of a Communication on Rolling Curves,	222
On the Extraction of Mannite from the Dandelion. By Messrs Smith; with an Analysis of the Mannite by Dr Stenhouse. Communicated by Dr George Wilson,	223
On some new Voltaic Arrangements with Chlorous and Chromic Acids, with an Account of a Battery, yielding electricity of great intensity, in which the negative as well as the positive element is Zinc. By Dr Thomas Wright. Communicated by Dr G. Wilson,	223

Biographical Notice of Dr Chalmers. By the Very Rev. E. B. Ramsay,	226
An Attempt to compare the Exact and Popular Estimates of Probability. By Bishop Terrot,	228
On the Gradual Production of Luminous Impressions on the Eye, and other phenomena of Vision. By William Swan, Esq.,	230
Note on the Refractive and Dispersive Powers of the Humours of the Eye, determined by Experiment. By John Adie, Esq.,	232
On Grooved and Striated Rocks in the Middle Région of Scotland. By Charles Maclaren, Esq.,	233
On a Simple Form of Rain-Gauge. By the Rev. Dr Fleming,	234
On a Method of Cooling the Atmosphere of Rooms in a Tropical Climate. By Professor Smyth,	235
Notice of a Shooting-Star. By Professor Smyth,	236
A few Unpublished Particulars concerning the late Dr Black. By Dr George Wilson,	238
On a New Voltaic Battery of Intense Power. By Dr Wright. Communicated by Dr George Wilson,	239
On a New Species of Manna, from New South Wales. By Dr Thomas Anderson,	239
Account of a Peculiar Structure found in the Vagmarus Islandicus. By Dr John Reid. Communicated by Professor Goodsir,	241
Notes to a Paper on the Motive Power of Heat. By Professor William Thomson,	241
Note regarding an Experiment suggested by Professor Robison. By Professor Forbes,	244
Personal Observations on Terraces, and other Proofs of Changes in the relative Level of Sea and Land in Scandinavia. By Robert Chambers, Esq.,	247
Note respecting the Dimensions and Refracting Power of the Eye. By Professor Forbes,	251
On the Intensity of Heat reflected from Glass. By Professor Forbes,	256
On the Solution of certain Differential Equations. By Professor Kelland,	257
On the Muscular Substance of the Tongue. By Mr Zaglus. Communicated by Professor Goodsir,	258
On the Volcanic Formations of the Alban Hills, near Rome. By Professor Forbes,	259
On the Gamboe Tree of Siam. By Dr Christison,	263
Notice respecting a Deposit of Shells near Borrowstounness. By Charles Maclaren, Esq.,	265
An Account of some Monstrosities. By the late Dr J. Reid. Communicated by Professor Goodsir,	267
The Effect of Pressure in Lowering the Freezing-Point of Water experimentally demonstrated. By Prof. W. Thomson, Glasgow,	267
On the Extinction of Light in the Atmosphere. By W. S. Jacob, Esq., H.E.I.C. Astronomer, Madras. Communicated by Professor Smyth,	271
Abstract of a Paper on the Hypothesis of Molecular Vortices, and its Application to the Mechanical Theory of Heat. By W. J. M. Rankine, Esq., Civil Engineer,	275